

Working Group 6  
RTCA DO-242A ADS-B MASPS  
Minutes of 9th Meeting held in Arlington VA.  
October 23-26, 2001

The attendees included:

Tom Foster, Rockwell Collins	Bill Flathers, AOPA	Robert Manning, AF/XOR-GANS
Stuart Searight, FAA / ACT-350	Jonathan Hammer, Mitre/CAASD	James Maynard, UPS AT
Jerry Anderson, FAA / AIR-130	Bob Hilb, UPS	William Morris, Raytheon
Richard Barhydt, NASA Langley	Gary Livack, FAA / AFS-400	Ken Staub, Trios Assoc.
		Tony Warren, Boeing Air Traffic Mgmt.

## **Tuesday, 23 October**

### **1. Introductory Remarks**

- Tom Foster began the meeting by welcoming everybody to the Rockwell Collins offices. It was agreed that the primary goals of the week were the review of the Intent white paper (242A-WP-9-02) and the update to the State Vector and Mode Status reorganization (242A-WP-9-01).

### **2. Review Agenda**

- The agenda was accepted as distributed.

### **3. Review and Approve Minutes of Last Meeting**

- On the review of section 2.1.2.2.2.2 “Altitude Rate”, it was asked that the group revisit the decision reached to not include Jonathan Hammer’s Kalman Filter Appendix and reference filtering algorithms in DO-185A instead. After some thought, it is felt those algorithms are to TCAS specific to be used for all ADS-B data links. It was noted that IP02 is an agenda item, and the group will discuss it when Jonathan is present. (*See discussion of 2.1.2.7.2 Altitude Rate in item 8 of these minutes.*)

### **4. Proposed Integrity Changes (NIC/NAC) [J. Maynard, T. Warren] {AI 6-4, 6-5, 6-22}**

- The group first reviewed the draft letter to be sent to SC-181 (RNP) regarding the availability of accuracy and integrity information associated with outputted PVT data in the WAAS and LAAS MOPS. (242A-WP-9-08)
  - It was agreed that this letter needs to be split into two letters with some of the GPS specific concerns (the last paragraph in particular) be in a second letter to be sent to SC-159 (GPS).
  - A paragraph needs to be added regarding time of applicability and stating what SC-186’s assumptions are on compensated latency.

- Material needs to be added about how this information is intended to be used by ADS-B so that it is demonstrated that this information does not need to be used externally.
- It will be proposed that SC-181 make sure their definitions of EPU, VFOM, and HFOM be consistent with those found in the GPS WAAS and LAAS documents.
- [AI 9-1] Tom Foster will edit the letter to SC-181 and write the letter to SC-159 as agreed to at this meeting.
- Review draft text of MASPS Changes (WP-242A-9-01)
  - This agenda item will addressed when the entire working paper 242A-WP-9-01 is reviewed as part of the discussion on SV and MS report re-organization.
- Discuss latency and time-to-warn issues {AI 7-1}
  - With NAC being placed in the SV and NIC and SIL being placed in the MS report, it was agreed that the MASPS is adequately addressing update rates for when there is a degradation of NIC and NAC. AI 7-1, however, is specific to whether improvements in these fields should be reported as promptly, or if they can be reported at the same intervals of the nominal SV and MS reports.
- HFOM, VFOM, EPU definitions {AI 8-6}
  - Stuart reported that he could not find suitable definitions for these terms in the draft WAAS and LAAS MOPS.
- SIL definition {AI 8-7}
  - Jim reported it will be included in 242A-WP-9-01 and can be reviewed on Wednesday.
- AI 6-5: (Clarify Tables 2-2 and 2-3 and all text referencing these tables that the requirements defined are “expected requirements” of the applications, and not actual requirements of the ADS-B system.)
  - This action item is still open. The instances of NUC will need to be replaced with NAC.
- AI 6-22 (Verify the accuracy of Note #3 on page 8 of 242A-WP-6-11.)
  - This will be closed with 242A-WP-9-01. (This will be verified during review of this paper later in the week.)
- Note for Table 2-1a and Table 2-1b {AI 4-4}
  - The note has been written and incorporated into the NIC/NAC white paper and 242A-WP-9-01.
- Vertical NIC (IP 39):
  - Will hopefully be included in 242A-WP-9-01 before it is reviewed later in the week.
- Clarification of “Navigation Center” Requirements (IP14) [Ken Staub] {AI 6-10}
  - The agreed to definition of ADS-B navigation reference point will be placed in the same section which discusses aircraft size codes. With the minor change of deleting the phrase “on an aircraft” from the first sentence.
  - Definitions will be placed in Appendix B. [AI 9-2]

- Jim Maynard will find or re-create the drawing done to illustrate the navigation reference point at meeting #7 of WG6.
- The briefing on Aircraft Size Codes (242A-WP-5-04) will be the basis into a new appendix for DO-242A. [AI 9-3] Ken will develop the presentation into an appendix.

5. Definition of aircraft on-ground and airborne states. (IP38) [AI 7-16]

- It was agreed that the definitions of when an aircraft is airborne and when it is on the surface must be from the point of view of when an ADS-B system has to transmit certain sets of data, and not from the point of view of ADS-B applications (e.g. when to display an airport map).
- Tables 2-9a and 2-9b from DO-260 which defines how the 1090MHz system determines when an aircraft is to broadcast surface and airborne position messages were reviewed. It was agreed that on-ground and airborne status determination will be done from the point of view of ADS-B transmit requirements, and not the operation perspective provided by Ken. [AI 9-4] Jim Maynard will develop material for the MASPS similar to the material found in DO-260.

**Wednesday, 24 October**

6. Issue Paper 13 (242A-WP-9-05)

- Stuart gave a brief review of 242A-WP-9-05 and relayed WG3's concerns on the Rannoch proposal for explicitly disallowing a variable update rate for stationary and moving aircraft on the airport surface.
- Bob Hilb reported that WG1 had asked WG3 not to implement the low on-ground transmission rate. The scenario that concerned WG1 was a stationary plane being blocked by a building, or other aircraft, and another plane taxiing around the blockage and potentially hitting the stationary aircraft before a position report is received.
- It was suggested that WG3 contact Rannoch Corporation and inquire if they will be agreeable to the proposed WG3 change in DO-260A for movement determination.
- It was suggested that WG3 consider changing the low transmission rate from 5 seconds to 3 seconds. This would need a change in the 95% requirement for Airport Surface rates in Table 3-4.
- WG6 feels that if DO-260A leaves the low rate at 5 seconds, it will not be in compliance with the MASPS.
- It was noted that the coast time allowed is 3 seconds, and that the WG3 argument that the position report can be updated with at intervals greater than the  $\frac{1}{2}$  the maximum coast time would not be in compliance with the MASPS.
- It was agreed that IP13 will be deferred for a future revision. This will allow WG3 or other parties to provide sufficient analysis in the future to justify having variable update rates for airport surface transmissions.
- [AI 9-5] Stuart will author a new Issue Paper requesting clarification and strengthening of Coast Intervals and Coast Update Rates. This definition will include coast times, and time of applicability. This Issue Paper will be addressed in Revision A and WG6 feels this MASPS update will address the original concerns of the IP13 authors.

7. Intent White Paper Review [T. Warren, R. Barhydt] (242A-WP-9-02)

- Bob Hilb stated his belief that European customers will urge for TCP and Intent capabilities for ADS-B in the MASPS. Eurocae has stated their need for long-term intent, and the British CAA have plans for short-term intent (selected altitude in particular).
- It was noted that if WG3 and WG5 bring their MOPS to plenary in June as currently planned, they will NOT implement the TCP changes in DO-242A. This topic, and whether WG3 and WG5 should address the TCP changes needs to be a discussion topic at the December SC186 plenary meeting.
- Tony and Richard lead a walkthrough of 242A-WP-9-02
  - It was agreed that the “Contents” column from Table 1 (field names) will be carried into tables 2 and 3 and the “Contents” column for those tables will be relabeled “Values” for those fields.
  - In Table 1, “Target State Report” (TSR):
    - the “Vertical Automation Capability” field of the TSR will be renamed “Target Altitude Type” or “Target Altitude Capability”.
    - “\*Validity Bit” will be changed to “Reserved for Vertical/Horizontal Conformance”.
    - “Horizontal Automation Capability” will be deleted.
    - 1 bit will be reserved for future growth of vertical information and 2 bits will be reserved for future growth of horizontal information. (This will leave both information sets at 8 bits.)
  - Table 4, “Trajectory Change Report (TCR):
    - To be consistent with the TSR definition in Table 1, all Horizontal components will be listed before the vertical components for the definition of TCR in Table 4.
    - To be consistent with Table 1, “Altitude Constraint Validity” will be changed to “Altitude Constraint Conformance”.
    - TCP Type (Vertical) will be increased to 4 bits.
    - Each TCP type will need to be defined with the minimum data elements required to properly transmit that TCP type.
    - The resolution for Latitude and Longitude will be loosened. For high precision uses of latitude and longitude in the future, new TCP types will be used that define the fields with higher resolution.
  - [AI 9-6] A revision to the paper will be distributed by November 16. [AI 9-7] There will then be a telecon on November 20 as a chance for final feedback (tentatively 1:00-3:00pm eastern). Comments from that telecon will then be incorporated into the paper for distribution to SC-186 for the December plenary. The target date for distribution to SC-186 is November 28.

## Thursday, 25 October

### 8. SV and MS reorganization (242A-WP-9-01) [Jim Maynard]

- Time of Applicability: This section and its text was moved to Section 2.1.2.1.
- Position attributes have been regrouped more cohesively in 2.1.2.6

- 2.1.2.7.2 Altitude Rate:
  - A discussion on which filter should be used as a reference for this section occurred. This was a continuation from the discussion held on Tuesday.
  - Jonathan believed the Jim's colleagues were looking at the wrong filtering algorithms in DO-185A.
  - It was proposed to defer the characterization of Barometric Altitude quality (Gilliam, 100ft, 25ft) for a future revision of the MASPS. Provisions will be made for the number of bits needed.
  - References to any filtering algorithms will be deleted from 2.1.2.7.2. In its place a table defining the characterization of altitude rate accuracy and latency will be added. Entries of this table will not be completed for Revision A, but bits will be reserved. (It is believed that 4 quality values will be sufficient – unknown, 100ft, 25ft, and finer than 25 ft.) The quality levels will address both accuracy and latency.
  - In section 2.1.2.11.5.1, instead of the RSVM Quality flag, there will be a two-bit table for barometric altitude accuracy, barometric altitude rate accuracy and barometric altitude rate lag.
  - A statement will be added that if the ADS-B derived baro altitude rate does not meet the requirements of the baro altitude quality table, baro altitude rate will not be transmitted.
  - The barometric altitude accuracy code reflects the quality both of externally provided barometric altitude and externally or internally provided barometric altitude rate.
  - [AI 9-8] Tom Foster will write an Issue Paper regarding the analysis needed to address the accuracy and latency requirements for altitude rate in a future MASPS revision.
- [AI 9-9] Ken Staub is going to inquire with Rich Jennings if an Issue Paper is needed requesting ADS-B equipment provide a transponder-like ID feature. This may be incorporated in the Emergency/Priority Status bits (Section 2.1.2.3.1).
- [AI 9-10] Jonathan Hammer will author an Issue Paper stating the need to have the ASA MASPS service levels carried into the ADS-B MASPS.
- [AI 9-11] Stuart Searight will review the WG6 minutes and provide a list of "Coordination Issues" identified between WG6 and WG4.
- [AI 9-12] Propose refinements to 2.1.2.10 of 242A-WP-9-01a to define the conditions for when a TCR needs to be re-issued. This criteria will not just be a change in the TCP sequence as written in 242A-WP-9-01, but will also be set for "major" changes in the data set, which Tony will define. These changes will be reflected in the White Paper as well so that they are consistent.
- Tony Warren asked if Equipment Levels should be broadcast. After some discussion it was agreed to stay with WG6's previous agreement that Equipment Levels will not be broadcast and a structure will be in place for the ASA Service Levels.
- [AI 9-13] Short-Term Intent: Richard will re-write this section with subsections for Target Altitude, Target Heading, and Target Track.

#### 9. Issue Paper 35: Note 7 for Table 3-4 [Jonathan Hammer] (242A-WP-9-07a)

- Jonathan reported the efforts of Steve Heppe, Bill Harman, and himself on reaching a resolution for IP35 that would be agreeable to everyone. To date, no such resolution has been identified. Some of the proposals included the following: a note stating operational

requirements might be met without meeting the requirements in Table 3-4; using dither; and the introduction of tau into the ADS-B system.

- Jonathan's latest proposal – to which there was not yet a response from Steve Heppe – is to replace note 7 with a note saying that the requirements need validation and will be addressed in the ASA MASPS. This approach seemed the best course of action to WG6.
- The replacement for note 7 was drafted as follows: “These standards represent best engineering judgment at the time of publication. Deviation from these standards may be acceptable provided that the applicant demonstrate that all required applications are supported. These requirements will receive additional validation during development of the ASA MASPS.”
- [AI 9-14] Stuart will email Steve, Bill, and Jonathan summarizing the WG6 discussion and agreement reached to resolve IP35 and ask for any final comments on this topic.

## Friday, 26 October

10. Gary Livack reported on his attempts to get WG1 and other parties to examine operational concepts for air-ground uses of TCPs and other possible enhanced surveillance elements. This attempt, while fruitless, closed AI 8-2.

### 11. Continuation of Review of 242A-WP-9-01

- 2.1.2.14 (as numbered in 242A-WP-9-01a) “Trajectory Change Intent” and its subsections will all need to be rewritten. This will be done after these topics are finalized in the Intent White Paper.
- Table 3.4.3.1:
  - Jim Stated he would like to remove the resolution requirements from the table and place them in the referenced sections that define the SV elements.
  - Tony felt the resolution for latitude and longitude where too crude.
  - Jim proposed to specify latitude and longitude in meters, rather than arc. While it was proposed that the resolution values for latitude and longitude be 5 meters when airborne, after examination of Table 3-4, it was decided that might not be attainable.
  - [AI 9-15] WG4 needs to examine the most demanding application for which they currently have understanding of provide the requirements for resolution (in meters) of horizontal position (lat/lon) for both airborne and on-ground aircraft. (This work might start in Appendix G.) Also requested are required resolutions for geometric altitude, ground speed while on the surface, and vertical rate.
  - The Report Mode field was questioned as to its purpose and why it is a required SVR element. It was agreed to write an Issue Paper on this topic [AI 9-19], circulate that Issue Paper for comment from some DO-242 authors, and delete the element unless convinced otherwise.
  - Regarding the SV coast time, Tony asked if a coast time is needed for each element, or if coast time for the entire report is sufficient.
  - [AI 9-20] Tom Foster will write up his summarization of the discussion on coasting, and element validity being based on message reception requirements.

12. Review of Action Item Status [et al]

13. Review Date and Place of Next Meetings [et al]

December 10-11, 14	WG6 in Arlington, SC186 at RTCA, Washington DC 9:00am Monday thru 5:00pm Tuesday, 8:30am-12:00 Friday
January 28-31	Boeing, Seattle WA* 9:00am Monday thru 3:00pm Thursday
February 12-15	Phoenix, AZ* ( <i>dependant on finding a sponser</i> ) 9:00am Tuesday thru 3:00pm Friday
April 8-9	RTCA, Washington DC * 9:00am Monday thru 5:00pm Tuesday
April 10-11	SC-186 Plenary: RTCA, Washington DC

\* *tentative meeting locations*

#### 14. Action Items

Action Number	Action Item Description	Assigned to	Status
9-1	Edit letter to SC-181 (242A-WP-9-08) and draft letter to SC-159 regarding availability of integrity and accuracy components for PVT data.	Tom Foster	
9-2	Provide definitions on navigation reference point and ??? for inclusion in Appendix B	Ken Staub	
9-3	Develop and appendix from 242A-WP-5-04 to justify aircraft size coding requirements being added to DO-242A	Ken Staub	
9-4	Develop definitions for determining on-ground and airborne status from the perspective of when ADS-B systems need to transmit specific data similar to the approach taken in DO-260.	Jim Maynard	
9-5	Author new Issue Paper requesting clarification of definitions for coast and coast intervals.	Stuart Searight	
9-6	Revise 242A-WP-9-02 per WG6 review and distribute it by November 16.	Tony Warren Richard Barhydt	
9-7	Organize a telecon for November 20 (tentatively 1:00pm eastern) to discuss updated intent white paper.	Tony Warren	
9-8	Write an Issue Paper regarding the analysis needed to address the accuracy and latency requirements for altitude rate in a future MASPS revision.	Tom Foster	
9-9	Inquire with Rich Jennings if an Issue Paper is needed requesting ADS-B equipment provide a transponder-like ID feature.	Ken Staub	
9-10	Author an Issue Paper stating the need to have the ASA MASPS service levels carried into the ADS-B MASPS.	Jonathan Hammer	
9-11	Review the WG6 minutes and provide a list of "Coordination Issues" identified between WG6 and WG4.	Stuart Searight	
9-12	Propose refinements to 2.1.2.10 of 242A-WP-9-01a to define the conditions for when a TCR needs to be re-issued. (This criteria will not just be a change in the TCP sequence as written in 242A-WP-9-01, but will also be set for "major" changes in the data set, which Tony will define. These changes will be reflected in the White Paper as well so that they are consistent.)	Tony Warren	
9-13	Re-write Short-Term Intent section of 242A-WP-9-01a with subsections for Target Altitude, Target Heading, and Target Track.	Richard Barhydt	
9-14	Email Steve, Bill, and Jonathan summarizing the WG6 discussion and agreed to resolution for IP35 and ask for any final comments on this topic.	Stuart Searight	
9-15	Examine the most demanding application for which they currently have understanding of provide the requirements for resolution (in meters) for the state vector report of horizontal position (lat/lon) for both airborne and on-ground aircraft. (This work might start in Appendix G.) Also requested are required SVR resolutions for geometric altitude, ground speed while on the surface, and vertical rate. (See table 3.4.3.1 of 242A-WP-9-01a)	Jonathan Hammer (WG4)	
9-16	Verify that 9 bits is a typo and should read 19 bits for amount of bits needed to support airborne applications in G.2.1 of Appendix G, or if this is a typo that.	Jonathan Hammer	
9-17	Provide mathematical argument for arriving at required resolution for heading while on ground.	Jim Maynard	



Action Number	Action Item Description	Assigned to	Status
9-18	Email Hal Moses and Jonathan Hammer informing them of WG6's plan for detailed briefings on DO-242A status, schedule, and plans.	Tom Foster	
9-19	Write and Issue Paper questioning the need for Report Mode in the State Vector Report. (site text at bottom of page 96 of DO242) Perhaps such a field is needed to convey what is known about a target, and whether it has yet been acquired.	Stuart Searight Jim Maynard	
9-20	Write up summarization of the discussion on coasting, and element validity being based message reception requirements.	Tom Foster	
8-1	Review and comment on proposed resolutions (LSBs) for TCR elements	Jonathan Hammer (WG4)	To be added to WG4/WG6 coordination list
8-2	Ask WG1 to examine possible con ops for air-ground uses of TCPs	Gary Livack	Completed (email 10/1801)
8-3	Provide WG6 with the finalized SC-193 definitions of Movable, Point, Line, and Closed-Polygon obstacles for incorporation into Appendix B.	Gary Livack	Remaining Open until Dec. SC-193 meeting
8-4	Rewrite section 2.1.2.2.2.2 to reference data smoothing algorithms in DO-185A rather than the new appendix previously agreed to which defined a simple Kalman filter.	Jonathan Hammer	Closed (242A-WP-9-01a)
8-5	Write brief paragraphs defining each of the Intent Capability Levels. (242A-WP-8-08)	Tony Warren	
8-6	Pull definitions for VFOM, HFOM, HPL, VPL, and EPU from GPS and/or RNP documents	Stuart Searight Jim Maynard	
8-7	Draft a note - or text if needed - for Table 2.1.2.3.2.4 clarifying the limits of what integrity components are encompassed by the SIL value. This material will state clearly that SIL only represents the integrity of the sensor providing the current data along the lines of "SIL is for reporting the sensor source integrity that is associated with the containment radius of the data being transmitted."	Tom Foster, Tony Warren	
8-8	Upon completion of the next draft of the TCP/Intent white paper, fill in the "TBD text" areas of draft section 3.4.3.5 "OC-TSR".	Richard Barhydt	
8-9	Create and Issue paper regarding On-Condition – Request for Information reports and include Jim's draft material on this topic from 242A-WP-8-01.	Stuart Searight	Completed (IP 49)
7-1	Consider from an operational point of view whether a change in value which improves NIC or NAC needs to be updated at the same rate as the state vector just like a detrimental change does, or if it can be update at the lower update rate of the Mode Status report.	Jonathan Hammer (WG4)	To be added to WG4/WG6 coordination list
7-2	Formally forward 242A-WP-7-16 to WG4 for consideration in their ASA MASPS work, and inform Pierre and Jean-Claude Richard of our review and actions of their submitted comments.	Tom Foster	Completed (9/7/01 email)
7-3	Update draft of the MASPS language for re-organization of the SV and MS reports (242A-WP-6-11A) and distribute it to WG6 prior to the September meeting.	Jim Maynard	Completed (242A-WP-8-01)
7-4	Inform Steve Heppe of the agreed upon resolution of IP46 and it's impact on closing of IP03	Stuart Searight	Completed (9/7/01 email)
7-5	Confer with Steve Heppe, Stan Jones, and Bill Harman and attempt to resolve IP35 to everyone's satisfaction.	Jonathan Hammer	Completed (242A-WP-9-07a)

Action Number	Action Item Description	Assigned to	Status
7-6	Incorporate into Appendix J the supporting study on altitude rate that demonstrated that geometric was the best altitude source followed by barometric, and then derived barometric.	Jonathan Hammer	Stuart needs to email Appendix J to Jonathan
7-7	Develop changes to Section 3.3.2, and Tables 3-3(a)&(b) addressing what messages each equipage class will be required to broadcast.	Jim Maynard	Partially Completed (242A-WP-8-01)
7-8	Write letter stating WG6 concerns with RNP MOPS and submit it to SC181.	Tom Foster	
7-9	Examine the MASPS and propose specific changes to clarify the MASPS requirements for surface position update rates to resolve IP13.	Carl Evers Rick Cassell	Completed (242A-WP-9-05)
7-10	Propose a label for an Emergency/Priority Status, and some new text for Appendix E to handle crash situations and Emergency Locator Transmitter functions. (IP41)	Bill Flathers	Completed
7-11	Tighten the wording in the State Vector requirements, that both barometric and geometric altitude shall be reported when available, and clarify what is meant by "when available". (IP42)	Jim Maynard	
7-12	Submit an addendum to IP43 discussing reasons why it was withdrawn.	Bill Flathers	Completed
7-13	Rework 242A-WP-6-02 per WG6's discussion at their August meeting on this Issue Paper	Stuart Searight	Completed (242A-WP-8-01)
7-14	Determine what changes are needed for removal of Turn Indication as a required SV element	Stuart Searight	
7-15	Implement proposed changes for IP 36	Stuart Searight	
7-16	Propose language that will define when an aircraft is considered on the ground and when it is airborne and the transitions in-between these states and propose what needs to be broadcast dependant on these states..	Ken Staub Bill Flathers	Completed (242A-WP-9-09)
7-17	Reword Issue Paper 19 to reflect the broader context of runway incursion alerting this paper now represents.	Gary Livack	
6-1	Draft letter to SC-181 asking if accuracy fields can be output on an avionics bus so that they can be used by ADS-B and if DO-229A GPS receiver's outputs (HFOM, VFOM, HPL) satisfy the requirements of DO-236A. (This will also close AI's 3-1 & 4-6.)	Tony Warren	Closed. (AI 9-1)
6-4	Search entire MASPS for instances of "NUC", "integrity", and "accuracy" to assure NIC/NAC changes are complete.	Stuart Searight	
6-5	Clarify Tables 2-2 and 2-3 and all text referencing these tables. (This material is not ADS-B requirements, but is rather "anticipated application requirements".)	Stuart Searight	
6-8	Write specific MASPS changes for air-reference velocity vector and IP37.	Richard Barhydt Jim Maynard	Completed (242A-WP-8-01)
6-9	Collect simulator data that will justify/support the MASPS IP37 changes.	Tony Warren	Completed (242A-WP-8-09)
6-10	Draft specific MASPS changes that address Aircraft size characteristic (IP04) and navigation reference point (IP14).	Ken Staub	
6-11	Clarify or change wording in proposed MASPS changes for IP05 so that anonymous addresses will be reset if duplicate addresses are detected.	Ron Jones	
6-18	Review the proposed revision of Table 3-5 in 242A-WP-6-11 and determine if it adequately resolves IP29 on the reporting of both geometric and barometric pressure altitude.	Steve Heppe	

Action Number	Action Item Description	Assigned to	Status
6-21	Examine to what accuracy does heading need to be recorded for aircraft on airport surface.	Ken Staub	Completed by Jim Maynard
6-22	Verify the accuracy of Note #3 on page 8 of 242A-WP-6-11.	Tony Warren	
5-1	Write an Issue Paper documenting the issues and concerns related to passive ranging. This Issue Paper will <u>not</u> be addressed in Rev A.	Jim Maynard	
5-3	Author a proposed footnote to the definition of ADS-B which talks to the link flexibility and protocol issues in response to the groups discussion on IP30.	Dan Castleberry	
5-15	Propose any needed additional aircraft/vehicle categories listed in 2.1.2.1.3. (IP06)	Gary Livack	Closed (242A-WP8-01)
5-20	Coordinate about work being done to resolve IP23 and IP32 regarding a way to map ADS-B capabilities, applications, features, and intended functions to the draft Advisory Circular on Guidelines to the Operational Approval for ADS-B Avionics.	Gary Livack Jim Maynard	
4-4	Write a note for Table 2-1a and 2-1b to address the independence of the accuracy and integrity values and to clarify the reference to DO-236A	Tony Warren	
4-6	Consult with Boeing navigation experts to obtain inputs on the MASPS definitions of navigation containment and integrity for consistency with RNP and GNSS standards	Tony Warren	Closed
4-7	Provide IP on proposal for ADS-B requirements to address formation flight characteristics	John Gonda	Also see AI 5-21
3-1	Formulate proposed requests of SC-181 regarding placing requirements on DO-236 (RNP) to provide inputs for ADS-B as it relates to NIC/NAC.	Tony Warren	Closed
3-6	Write White Paper on backward compatibility subject	Tom Foster	
3-9	Write comments to IP15 explaining rationale for rejecting	Dan Castleberry	
2-15	Produce IP on protecting ADS-B services from other services provided by a shared data link	Tom Foster	Closed IP48
2-16	Write ad hoc group's response to issue #3 of IP7 that will put issue in broader context and serve as proposal to WG#4 for consideration in the ASA MASPS.	Dan Castleberry	